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THE CERCARIA OF *APOPHALLUS BREVIS*[1]

BY M. J. MILLER[2]

Abstract

The cercaria of *Apophallus brevis*, the causal agent of black spot disease of trout, is described and shown to be a typical pleurolophocercous cercaria.

Lyster (3) showed that the so-called black spot disease of trout was caused by the metacercaria of a trematode that was described as the new species *Apophallus imperator*. Miller (4, 5, 6) in later studies showed that *A. imperator* is synonymous with *A. brevis* and that the intermediate snail host is *Amnicola limosa*, while the definitive host in Quebec was the loon (*Gavia immer*). Thus while the general life cycle of this parasite has been worked out, the intermediate stages have not as yet been described. The following is a description of the cercaria of *A. brevis*.

Comparatively large pleurolophocercous oculate cercaria—body almost totally devoid of golden-brown pigment, almost colourless; cuticula from anterior tip to level of eye spots with numerous small spines; oral sucker with prominent spines; numerous, hair-like protoplasmic extensions of the cuticula present; small pharynx present; 14 cephalic glands in the centre of the body divided into two groups, with four bundles of ducts leading anteriorly over the dorsal surface of the oral sucker to the mouth opening, four ducts in each of the inner and three in each of the outer bundles. Excretory bladder large and seen frequently in fresh material—in stained preparation it shows up as a group of deeply stained cells; genital primordium just anterior to the excretory bladder; acetabulum present but inconspicuous; numerous cystogenous glands situated laterally below the level of the eye spots; base of tail with lateral and ventral cuticular expansions; prominent dorsal fin-fold starting about one-third the distance from proximal end of tail, continuing around to the ventral surface and gradually narrowing to reach half-way along the length of the ventral surface of the tail.

Absolute measurements are highly variable in an organism as contractile and extensile as this cercaria. In permanent preparation, using alcohol as a

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fixative and alum carmine as a stain, the following measurements were determined:—

Length of body	0.124 to 0.175 mm.
Width of body (at widest part)	0.059 to 0.070 mm.
Length of tail	0.416 to 0.450 mm.

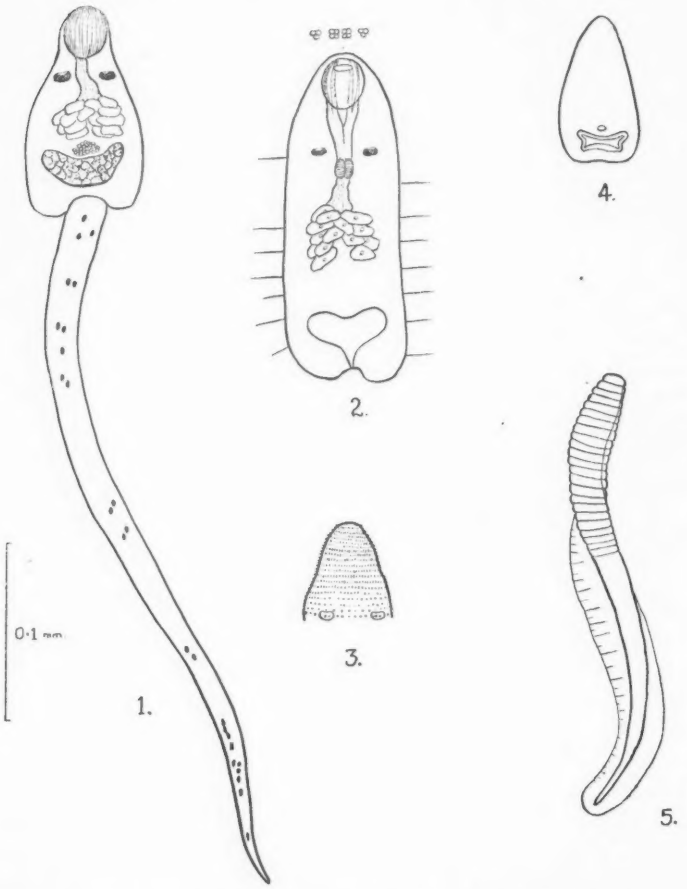

FIG. 1. *Cercaria of Apophallus brevis fixed in alcohol and stained with alum carmine.*

FIG. 2. *Sketch of living cercaria of A. brevis, flattened to show penetration glands with ducts, pharynx, genital primordium, excretory bladder, and protoplasmic extensions of cuticula. The pattern of duct openings is figured above proximal tip of body.*

FIG. 3. *Sketch of anterior tip of living cercaria of A. brevis to show spination of cuticula.*

FIG. 4. *Sketch of living cercaria of A. brevis, ventral view, to show acetabulum situated anterior of excretory bladder.*

FIG. 5. *Sketch of the tail of living cercaria of A. brevis to show character of fin-fold.*

NOTE: *Figs. 2 to 5 are free-hand sketches all of which show different magnifications.*

Width of tail	0.019 to 0.021 mm.
Oral sucker	0.028 to 0.031 mm. by 0.022 to 0.024 mm.

In general this cercaria shows the characteristic morphological structure of the pleurolophocercous group, but is somewhat distinctive owing to its almost complete lack of golden-brown pigment. The pharynx can be made out readily in fresh material but is difficult to see in mounted preparations. The acetabulum is seen only rarely even in fresh material. The protoplasmic extensions of the cuticula start to disappear very quickly when the cercaria is being subjected to manipulation, in the manner described by Cable (1).

Studies on the behaviour of these cercariae have shown that they exhibit a weak phototactic response, and no shadow response. They are very active under the cover slip and show an average of five swims per minute.

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